Polymer - Plastics Technology and Engineering, vol.46(6), 2007, pages 579-584

Curing characteristics, fatigue and hysteresis behaviour of feldspar filled natural rubber vulcanizates

Abstract

Curing characteristics, fatigue, and hysteresis behaviour of feldspar filled SMR L vulcanizates and feldspar filled ENR 50 vulcanizates were studied. Two different types of natural rubber, SMR L and ENR 50 having 0 and 50 mol% of epoxide groups were used. The feldspar filled natural rubber vulcanizates were compared at similar filler loading which were used at 0, 10, 20, and 30 phr of filler loading. The curing characteristics such as scorch time (t_2) and cure time (t_{90}) slightly increased with increasing feldspar loading for both rubber vulcanizates. Besides t_2 and t_{90}, maximum torque (MHR) significantly increased for bothrubbers with increasing feldspar loading. The fatigue test showed that fatigue life decreased with increasing extension ratio, strain energy and filler loading. As the filler loading increased, the poor wetting of the feldspar by the rubber matrix gave rise to poor interfacial adhesion between filler and rubber matrix. Results also indicate that the vulcanizates with the highest feldspar loading exhibited the highest hysteresis. The feldspar filled SMR L vulcanizates showed higher fatiguelife and lower hysteresis compare to feldspar filled ENR 50 vulcanizates.

Keywords — Cure time, ENR 50 vulcanizates, fatigue, feldspar, hysteresis, maximum torque, scorch time, SMR L vulcanizates.